



First Light

The Newsletter of the Cape Cod Astronomical Society



January, 2016

Vol. 27 No. 1

[Happy New Year, Everyone!](#)



[Geminid Meteor Shower Peaks Under Dark Skies, 2009](#)

During the 2009 Geminid shower, astrophotographer Tony Rowell shot this fireball over a Christmas tree near Rock Creek Lake above 6000 feet in the Sierra Nevada mountains. 20 second exposure. (please see Ref 7.)

Our Next Monthly Meeting: is Thursday, January 7th, at 7:30pm in the D-Y High School library.

Following up on his excellent tutorial on **Black Holes** last month, CCAS member and scientist Jim Lynch will refresh our understanding of the formation of the universe and look at some aspects of Big Bang physics that might be new to us; Jim's title: **The Big Bang. ...In the beginning...**

Reminder: The next "Quarter-Moon-Saturday" Star Party (public welcome) is Saturday, January 16th at 7:30pm. We are also continuing once-a-month "New-Moon-Saturday" "work" evenings for *Staff and CCAS Members only*: January 9th. Please see more information on both these opportunities with schedules on page 4.

In this issue: New member / Telescope Donation Proposed / Appreciative Visitor / Assisting Library with Telescopes / Need Speaker for February Meeting / Get Involved at the Dome / Quadrantid Meteors / Jupiter Moon Transits / Venus-Saturn "Conjunction" /

Bright New Stars:

We welcome Dennis Mascio to membership in CCAS. Following his participation in the December 3rd CCAS meeting, he brought his telescope (a Celestron 127 Newtonian 5" reflector) to the scheduled CCAS Star Party on December 19th. Dennis received some assistance in set-up of his 'scope at this event and was introduced to many of the equipment and people resources at The Schmidt. Welcome to CCAS membership, Dennis!

We like to profile new members in our Society in this section of *First Light* each month. If you are a new member and have not yet been so recognized, or might have new information for us (background, astro equipment preferred, interests, etc.) on yourself or someone else, please let us know (email info@ccas.ws).

MEMBERS: PLEASE CONSIDER SUBMITTING AN ITEM OR ARTICLE FOR PUBLICATION IN *FIRST LIGHT*.

CCAS News Items and Current Events:

Astronomer Offers to Donate Telescopes:

We are pleased to announce that Peter Williams, a staff member at the Harvard-Smithsonian Center for Astrophysics has offered to donate two telescopes to CCAS for use by the Society and/or CCAS contacts that we support. He is offering a ~ 10" Celestron Newtonian mounted on a German Equatorial Mount, and a Meade ETX-90 5" Maksutov-Cassegrain Go-To 'scope with tripod and accessories. We will follow up with Peter on this opportunity during January.

Note from a Very Appreciative Star Party Participant:

During November, one Elizabeth Ellsworth inquired about learning to use binoculars for observing the night sky. Bernie Young arranged to open the Dome for her and family members on November 27th. Gus Romano and Gail Smith assisted at this event. Although the evening turned out to be cloudy, the visitors were very pleased with their experience. Elizabeth sent this most supportive email on December 14th:

Dear all,
I wanted to say THANK YOU once more for the most wonderful evening at the observatory. Even though we had a cloudy night, we got to see an incredible moon and learn about binoculars and star-finding and the observatory and its activities. You made our week for sure. I'm looking forward to seeing you again sometime very soon for one of the lectures/programs at the observatory and thanks for the invitation to do so.
Cheers, happy holidays to you all, and keep looking up, All best, Liz.

Thank you, Elizabeth, for your note. Please come to another CCAS event as soon as you can!

Thank you Bernie, Gus, and Gail for a very special outreach.

Local Retired Professor of Astronomy Proposing Telescopes for Snow Library:

We received a note from Judy and Jarvis Hunt (current members of CCAS) in November informing us that the Hunts are thinking of buying two or more telescopes for Snow Library in Orleans for lending, and have proposed this idea to Tavi Pugno, Director of the Library.

Judy and Jarvis hope that the library will take them up on the idea and that this might be the beginning of Lower Cape Libraries lending telescopes.

Judy provided Peter Kurtz's name to Tavi as a contact who might be able to assist in finding advisors for this program among CCAS members if the idea moves forward.

If and when Peter is contacted by the library about this initiative, we will follow up by trying to find one or more folks from CCAS willing to visit with library personnel to chart a course forward. This could include guidance on equipment they might propose to acquire and ways we could otherwise support the program. Anyone having an interest in this venture please let us know at info@ccas.ws Stay tuned!

CCAS Meetings:

Many thanks to CCAS member, WHOI physicist, and amateur astronomer Jim Lynch for his tutorial on **Black Holes... Their Ins and Outs (Mostly Outs)** at our meeting on December 3rd. Please see the excellent review of this talk put together by our Secretary, Gus Romano, in the minutes of the meeting (web address is given just below.)

We are pleased to report that Jim will teach us more physics at our CCAS meeting on January 7th. In **The Big Bang... In the beginning...** Jim will refresh our understanding of the formation of the universe and look at some aspects of Big Bang physics that might be new to us.

"The story of the Universe's origins is perhaps the most fascinating story in modern science. At this point in time, there are many excellent television and Internet shows available for download which discuss the Big Bang, the initial moment of creation. And while I will unavoidably repeat some of this material in my talk, I'd also like to "paint outside the box" a bit, and show some aspects of Big Bang physics that are not discussed so often. This is a decidedly hard topic, being the confluence of general relativity and quantum field theory (two of science's most mathematically intricate theories), but I'll try hard to keep the focus on the basic concepts!"

Please see last month's *First Light* for more information on Jim Lynch's background.

As of today, we are still looking for a speaker and topic for our February meeting.

Looking ahead, we are very pleased to announce that **Professor Larry Marschall** of Gettysburg College, astronomer, teacher and always an excellent speaker, will speak to us in March on **Comets' Tails - an Update on the Rosetta Mission**. More information, when available.

Reminder:

Gus Romano (or his delegate) "hosts" a Dutch-treat dinner gathering for members and friends on each CCAS meeting night (before the meeting) at the South Yarmouth Hearth & Kettle restaurant at 5:45pm; (the meetings begin at 7:30 at D-Y.) The speaker for each meeting is always invited.

Please join the group to dine and talk about all things interesting, including astronomy! The H&K is at 1196 Rte 28, South Yarmouth, about a half mile west of the Station Avenue/Main Street intersection with Rt. 28 (traffic light).

Mike Hunter, CCAS President, is our Program Chairman. Please contact Mike or info@ccas.ws if you have any leads on speakers for February or April and beyond.

Members, PLEASE participate in the effort to recruit good speakers to present programs in astronomy and related sciences at our meetings.

Please let us know if you have any leads...

or, even better, volunteer to give a talk yourself!

The 2015-2016 **Dues cycle** began at our July meeting. Dues for most folks are \$30/year. We need this money to pay our bills and support our Observatory! Please bring your check to the next meeting or mail right away to: CCAS, 34 Ridgewood Rd. Orleans MA 02653. Thank you.

Thank you all for a very good response this time around. We still have several active members who are more than a year in arrears. Please, everyone, "get current" as soon as possible.

The Cape Cod Astronomical Foundation is now participating in the AmazonSmile program (<http://www.smile.amazon.com>); please go to this Amazon login page and sign up. Going forward, 0.5% of the price of all your Amazon purchases will be donated to the Cape Cod Astronomical Foundation when you are a signed-up

participant.

Minutes:

The minutes of the December meeting are on our website; click on the "Minutes" button at www.ccas.ws or click here <http://www.ccas.ws/minutes/ccasminutes120315.pdf>

From the Dome:

Update on Schmidt Observatory Programs for D-Y Students

We reviewed initial planning for day- and night-time visits to The Schmidt for D-Y students in the October issue of *First Light* and provided an overview of detailed planning of special astro projects for D-Y Honors Students in the November issue.

Bernie Young and Space and Earth Teacher Jim Mitchell have been providing updates on these programs to *First Light*. We hope to continue to receive more input. Bernie, Jim, please send another overview at checkpoint time in your programs. Thank you.

When we have enough information, we will create a feature story on these programs for an upcoming issue of *First Light*.

CCAS Members: Once again: There are many good things happening these days at The Schmidt. Please consider involving yourself. Contact Bernie or Joel directly if you can help or notify us at info@ccas.ws and we'll pass your interest along.

"Winter" Schedule of "Quarter-Moon-Saturday" Star Parties Continues:

Want to know what a "Quarter-Moon-Saturday" Star Party is? Our website ("Star Parties and Activities Info" button) describes it this way:

From September thru June, we will have one regularly scheduled Star Party each month at 7:30pm – 9:30pm on the Saturday closest to the date of First Quarter Moon (about 7 days old.)

When the moon is near its First Quarter, the terminator (the line dividing light from dark) is favorable for viewing sunlight or shadow on the sides of craters. This time is also good for observing the dark side of the moon occult (cover) stars in the sky beyond it as it moves in its orbit.

The continuing schedule for "Quarter-Moon Saturday Star

Parties” follows. All events begin at the Dome at 7:30pm on the following evenings and end at 9:30pm: Public always welcome.

Saturday	February 13 th
Saturday	March 12 th
Saturday	April 9 th
Saturday	May 14 th

FOR MEMBERS ONLY:
“New-Moon-Saturday” Work Sessions at the Schmidt Continue:

Starting time is always 7:30pm:

Saturday	January 9 th
Saturday	February 6 th
Saturday	March 5 th
Saturday	April 2nd
Saturday	May 7th

These meetings, held each month on the Saturday closest to the New Moon, provide a regular opportunity for CCAS members to work on projects at the Dome and/or to become better acquainted with our equipment and more involved with Dome activities and operations including maintenance.

If you are a CCAS Member, and not yet involved at the observatory, this is your opportunity to join in, have fun, share stargazing, learn about observing and using our equipment with the Observatory Staff.

As always, “Private” group or individual observing sessions at the Werner Schmidt Observatory may be scheduled by contacting Observatory Director Joel Burnett at Joelburnett@comcast.net or sending an email to info@ccas.ws

Our Society exists to promote observing! Help us promote this objective by asking for time at the Dome!

CCAS has both 8” and 14” Dobsonian telescopes for loan to members. Contact info@ccas.ws if you wish to borrow one.

January Observing:

Observing Resources:

Please see resources in the January issue of *Astronomy Magazine*, pp 36-43, and *Sky and Telescope*, pp 41-60 and Reference 5 for good guides to the sky. See *AM*, p41, *S&T*, pp 50 and reference 6 for positions of the moons of Jupiter and Saturn and special phenomena of the moons of Jupiter this month.

Highlights in the Night Sky for January:

- The **Quadrantid meteor shower** peaks before dawn January 4; a waning crescent moon is too weak to play a negative role. This shower should be prolific: observers under an otherwise dark sky can expect to see up to 120 meteors per hour shortly before morning twilight commences; a bit fewer sightings earlier. The radiant for this shower is in the constellation Boötes; the name Quadrantids originates in the now defunct constellation named Quadrans Muralis. You might see stray Quadrantids on the evenings before and after 4 January.

Mooncusser’s Almanac and Monthly Alert ¹			
JANUARY 2016			
Object	Jan 1 (EST)	Jan 15 (EST)	Jan 31 (EST)
Sun	R: 07:07 S: 16:20	07:05 16:34	06:54 16:54
Moon	R: 23:19 S: 11:13	10:30 22:48	23:55 10:43
Mercury <i>(sun, then dawn)</i>	R: 08:20 S: 17:51	06:41 16:31	05:25 14:57
Venus <i>(predawn)</i>	R: 04:09 S: 13:56	04:37 14:01	05:02 14:19
Mars <i>(predawn)</i>	R: 01:18 S: 12:15	01:02 11:40	00:41 10:59
Jupiter <i>(all nite)</i>	R: 22:17 S: 10:51	21:21 09:56	20:14 08:52
Saturn <i>(predawn)</i>	R: 04:50 S: 14:23	04:02 13:33	03:05 12:35
Uranus <i>(evening)</i>	R: 11:34 S: 00:24	10:40 23:29	09:37 22:28
Neptune <i>(early evening)</i>	R: 10:06 S: 21:05	09:11 20:11	08:10 19:11
Pluto <i>(in the sun)</i>	R: 07:17 S: 16:46	06:24 15:53	05:23 14:52

- Evening planets: Mag 7.9 **Neptune** and mag 5.8 **Uranus** are “stars” of the early evening planet show this month. Neptune and Uranus are joined a bit later in the evening by Jupiter: the big planet rises just before 11pm on New Year’s Day and is up just after 8pm at month’s end.
- If you don’t mind losing some sleep, watch some Jupiter moon transits late on January 10/11. Beginning at 11:37pm on January 10th, you can watch **three of Jupiter’s Galilean moons (and one shadow) transit** the face of the planet. Europa begins the show exiting the face at 2:21am; Callisto transits for two hours beginning at 3:04am; Io’s shadow begins its journey at 4:22am, and, finally, Io itself begins transit at 5:27am.

- When blazing mag 4 **Venus** rises at 4:24am Cape Cod time on Friday, January 8th, it will look like a *double* planet; binoculars or a small telescope will show mag 0.5 **Saturn** rising 4 minutes behind Venus, the two separated by only 52.5' !!!! This is as close as they have appeared in more than a decade: when they are rising over western Europe a bit earlier, they will be separated by only 5'.
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Minima of Algol^{1,3}, January:

Algol, a variable double star in Perseus, shines normally at mag 2.1 but once every 2.87 days dims to mag 3.4. The dimming is caused by the dimmer of two self-orbiting stars eclipsing the brighter as viewed from earth.

There are three convenient evening occurrences of the Minima of Algol this month: Wednesday, January 6th, at 10:31pm, Saturday, January 9th, at 7:20pm, and Friday, January 29th, at 9:05pm.

Using binoculars or a small telescope, try to begin viewing two to three hours before the minima to watch the dimming (record magnitudes now and then by comparing Algol with neighboring constant magnitudes) and up to two to three hours after the minima to watch the brightening.

Declination Tables for the Moon² during this month.
Please contact your editor for information or sources.

Moon Phases, January, 2016

Last QTR, Saturday, January 2nd, at 12:30am EST
New Moon, Saturday, January 9th, at 8:31pm EST
First QTR, Saturday, January 16th, at 6:26pm EST
Full Moon, Saturday, January 23rd, at 8:46pm EST

**NOTICE: NEW COPIES OF THE
BROCHURE INTRODUCING CCAS
AND ITS ACTIVITIES ARE
AVAILABLE; INQUIRE AT
info@ccas.ws IF YOU WISH COPIES.**

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The **Cape Cod Astronomical Society** meets at 7:30 pm on the first Thursday of every month in the library of the Dennis Yarmouth Regional High School in Yarmouth, Massachusetts. Meetings are open to the public. Membership dues are \$30 for adults, \$15 for students in two year colleges and part year residents, and no charge for spouses or for students in K12 schools.

REFERENCES AND NOTES FOR THIS ISSUE:

- 1) Information for The Mooncussers Almanac and Monthly Observing Alerts was extracted from Sky Events, Astronomy Magazine Online (Astronomy.com), Stargazing.net's Planet Rise/Transit/Set calculator (<http://www.stargazing.net/mas/planet2.htm>), *Astronomy Magazine*, *Sky & Telescope Magazine*, *Sky and Telescope Skywatch 2011*, and other sources. The *Observer's Handbook, 2010 and 2011*, published by The Royal Astronomical Society of Canada is also an important reference, particularly for information on lunar libration and declination and the minima of Algol.
- 2) Information on how Libration and Declination Maxima and Minima can make visible parts of the moon normally hidden was reviewed in the January 2007/January 2008 *First Light*. Quick recap: Max Long brings to view extra right side; Min Long, extra left side; Max Lat, extra north side; Min Lat, extra south side. Max Dec puts it high in our sky during its transit; Min Dec puts it low.
- 3) Algol is an eclipsing variable star in Perseus which has its brighter component eclipsed or covered by its companion once every 2.87 earth days. When the dimmer component is not eclipsing the brighter, Algol appears typically about magnitude 2.1; when eclipsed, magnitude 3.3 The minima usually lasts about two hours with two hours on either side to bring it back to mag 2.1. Good comparison stars are γ Andromedae to Algol's west, mag 2.1, and ϵ Persei to its east, mag 2.9. S&T's reliable calculator for Minima of Algol dates and times can be found at: <http://www.skyandtelescope.com/observing/celestial-objects-to-watch/the-minima-of-algol/>
- 5) Here is the web address for Astronomy Magazine's "The Sky This Month" online for January: <http://www.astronomy.com/magazine/sky-this-month/2015/12/morning-sky-delights>
- 6) S&T's interactive Java utility for showing the positions of Jupiter's main moons for any date and time: <http://www.skyandtelescope.com/observing/objects/planets/3307071.html>
for Saturn's moons: <http://www.skyandtelescope.com/observing/objects/planets/3308506.html>
- 7) <http://astronomy.com/observing/2015/12/geminid-meteor-shower-peaks-under-dark-skies?spMailingID=24224485&spUserID=MTgwODg1MTA1MjM0S0&spJobID=701206747&spReportId=NzAxMjA2NzQ3S0>